

Public Health Reports

Vol. 63 • DECEMBER 24, 1948 • No. 52

Some Qualitative and Quantitative Factors in Nurse Education

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There is a demand for more and better health services throughout the Nation. Since nursing is a vital component of all hospital, medical, and health programs, there is currently much concern about the scarcity of nurses as well as other health workers. The kind of nursing care available is directly dependent upon the quality of the educational programs in our schools of nursing. Some critics believe that the professional nurse is being over-educated;¹ others state that there are too few competent nurses.²

What is the quantity and quality of nurse production in various States as judged by selected criteria affecting production? It is expected that data presented here will shed some light on the actual nation-wide situation. This study is concerned with the supply of nurses and the kind of preparation they receive. Criteria which take into consideration enrollment and graduation statistics, number and kind of educational programs provided, quantity and preparation of administrative and instructional personnel, over-all curriculum standards and achievement of candidates on licensure examinations have been selected for each State and applied to the data available. There are admittedly other criteria for evaluating quantity and quality of nurse production. However, those presented here seem particularly pertinent to the investigation of the problem.

There are recognizable differences between schools of nursing which affect the educational pattern of individual States. Some schools may barely meet the minimum requirements from year to year. Others may have developed an educational program far above the minimum. The degree of excellence of a single large school may influence considerably the over-all nursing picture within a State.

¹ Naffziger, Howard C., et al., Resolutions of American Surgical Association on Nursing Problem, *The Journal of the American Medical Association*, April 12, 1947, p. 1168.

² Petry, Lucile, Expand the Nursing Curriculum, *The Modern Hospital*, September 1947, p. 75-76.

Educational and social philosophy, resourcefulness, and effort are reflected in any nursing education program.

Because of the many variations between schools within States it may appear that a comparison of schools rather than States would be a better approach to the investigation. However, standards of nursing education should be a matter of concern to States. The number of graduate nurses produced is an indication of the ability of the State to meet its nursing needs. The quality of the product of the educational system is actually the quality of a State (and national) resource.

Schools, students, and administrative and instructional personnel are being considered here as resources. The administrative and instructional personnel and other facilities are not equally distributed in all schools and thus are not available to all students. However, information presented here should indicate the number and qualifications of persons available within a State to carry out all educational and administrative functions in the schools studied, the size of their task and the over-all evaluation of basic nursing education.

Sources of Information

The wartime program of nurse education, established by Public Law 74 (Bolton Act), made available to the Public Health Service considerable information about the schools of nursing in this country. At the end of the war, the Advisory Council to the Division of Nurse Education, Public Health Service, recommended that a study be made of the information about the nurse education programs which was submitted by schools participating in the Federal Nurse Training Program.³ Such a study, made possible through the cooperation of the National Nursing Council for War Service, began with the collection of data in August 1945 and was completed in April 1946.

Of the 1,313 schools of nursing which met minimum requirements set by State law, 1,125 (87 percent) participated in the Federal Nurse Training Program from July 1, 1944, through June 30, 1945, the fiscal year selected for study. Data from the 1,125-school study is the chief source of information for the present investigation. These 1,125 schools are frequently referred to hereafter as "participating schools." Of these schools, 98.2 percent were hospital schools of nursing, and 1.7 percent functioned within colleges and universities.

In using these data, bear in mind that the information was submitted by the individual schools as a justification for continued participation in the Federal Nurse Training Program and that 1944 to 1945 was a wartime year. Information was tabulated as presented by the schools.

³ Sometimes called the Cadet Nurse Corps program.

It is assumed that the 1,125 schools participating in the Federal Nurse Training Program "put their best foot forward" in presenting information and that when information requested was not reported the schools had nothing favorable to report. Secondly, it is assumed that administrative and instructional personnel and student nurses are State resources for health and that, therefore, States have responsibility for the quality of the nurses produced as well as for the quantity produced. A third assumption is that States are potentially able to maintain schools adequate to prepare nurses to meet the nursing needs of all citizens.

Limitations of Investigation

The study is limited by the amount of data available on the subject (and by the number of schools of nursing which participated in the program), the accuracy of the schools in reporting information requested, and the fact that the material presents a picture of nurse education as it was in fiscal year 1944-45.

In 46 States a sufficiently high percentage of all schools participated in the Cadet Nurse Corps program to make assumptions about nurse education within the State reasonably valid. Nevada has no schools of nursing and only 3 of the 25 schools of nursing in Mississippi participated in the program. These two States, the District of Columbia, which is strictly a metropolitan area, and Puerto Rico, are omitted in tables presented in the study for comparative purposes, except in totals and averages quoted for the United States.

Selection of Criteria

In selecting the criteria for evaluation of the apparent over-all programs of the States in relation to each other, it was decided that it would be necessary to find out:

1. The quantity of potential nurse resources in each State as indicated by the number of student nurses per 100,000 population enrolled in schools of nursing in the United States in 1945.

2. Educational facilities provided to prepare potential nurse resources at two educational levels as indicated by the ratio of students enrolled in diploma programs to those enrolled in degree programs.

3. The number of personnel responsible for nurse education as indicated by the ratio of students to administrative and instructional personnel.

4. The educational standards for administrative and instructional personnel as indicated by the ratio of students to instructors with bachelor's degree or above.

5. The educational effort of administrative and instructional

personnel as indicated by the ratio of students to instructors with advanced preparation of some kind.

6. The specific advanced professional education of administrative and instructional personnel as indicated by the ratio of students to instructors with advanced preparation in nurse education.

7. The estimated quality of nurse education programs in individual States as indicated by the rating of schools within each State based on the evaluation by nurse consultants of the entire curriculum.

8. The educational achievement of the nurse product of the State educational system as evident in the percent of nursing schools indicating that 91-100 percent of their students passed examinations for State licensure in 1944-45.

Potential Nurse Resources in 1945

It has been assumed for the purposes of this study that each State has a responsibility for producing the United States average number of students per population. There are many factors which determine whether or not this assumption is valid for a particular State and careful study must be made of each State and regional area before a specific quota for student production could be set. Student nurse enrollment in 1945 ranged from 216 students per 100,000 population in North Dakota to 15 per 100,000 in New Mexico and none in Nevada.⁴ The United States average student nurse ratio per 100,000 population was 102, approximately one student per 1,000 population. Of this number, 95.3 students were enrolled in diploma programs and 6.6 in degree programs (table 1).

Because of intensive recruitment to meet the wartime needs, 1945 was a year of high student enrollment. Regional differences may be noted in table 1. The States are arranged according to Public Health Service districts. Diploma and degree candidates are shown separately. Leading all areas is New York district which had 141 students per 100,000 population while New Orleans district had only 49 students per 100,000 population enrolled in both diploma and degree programs. These districts are the extremes also in number of students per 100,000 population enrolled in degree programs, New York district having 11 and New Orleans district, 2.

Approximately half of the States were preparing less than one nurse per 1,000 population. Either some of these States will be "debtor" States, dependent on other States to provide nursing care for their hospitals and other health services, or nursing care provided may be expected to be far below a desirable minimum for the average citizen.

Outstanding examples of "debtor" States are those in the New Orleans district shown in table 1. Eight of the 10 States in this

⁴ 1945 Census Estimates and Facts About Nursing 1946, p. 32.

Table 1. Student nurses per 100,000 population¹ enrolled in diploma and degree programs

	Schools ²	Diploma candidates per 100,000 pop.	Degree candidates per 100,000 pop.	Annual per capita income 1946
United States Total	1,271	95	7	
New York District No. 1³	423	130	11	
Connecticut.....	20	152	23	\$1,465
Delaware.....	7	187		1,493
Maine.....	16	126	6	1,044
Massachusetts.....	64	165	4	1,356
New Hampshire.....	14	159	.2	1,048
New Jersey.....	42	115	2	1,494
New York.....	121	105	21	1,633
Pennsylvania.....	124	150	3	1,238
Rhode Island.....	5	92	6	1,347
Vermont.....	10	162	9	1,085
Richmond District No. 2	160	85	4	
District of Columbia.....	8	139	25	1,569
Maryland.....	23	113	1	1,293
North Carolina.....	47	70	2	817
South Carolina.....	18	63	2	729
Virginia.....	34	77	4	952
West Virginia.....	30	92		914
Chicago District No. 3	258	99	5	
Illinois.....	96	119	3	1,486
Indiana.....	28	92	3	1,158
Kentucky.....	14	49		778
Michigan.....	30	86	4	1,215
Ohio.....	65	112	8	1,302
Wisconsin.....	25	93	16	1,198
Kansas City District No. 7	153	128	8	
Iowa.....	27	120	6	1,183
Kansas.....	35	110	4	1,062
Minnesota.....	25	184	19	1,090
Missouri.....	30	89	5	1,143
Nebraska.....	13	112	10	1,164
North Dakota.....	14	216		1,162
South Dakota.....	9	174	5	1,228
San Francisco Districts No. 5 and 8	111	77	9	
Arizona.....	4	60	3	995
California.....	41	50	5	1,531
Colorado.....	14	128	21	1,196
Idaho.....	8	94	1	1,243
Montana.....	6	196	17	1,349
Nevada.....				
Oregon.....	11	107	21	1,183
Utah.....	6	123	13	1,063
Washington.....	19	122	20	1,346
Wyoming.....	2	26		1,264
New Orleans Districts No. 4 and 9	166	47	2	
Alabama.....	17	33	.04	733
Arkansas.....	8	29		697
Florida.....	14	40	4	1,010
Georgia.....	17	53	2	809
Louisiana.....	16	81	7	784
Mississippi.....	25	20		555
New Mexico.....	1	15		911
Oklahoma.....	13	39	.2	825
Tennessee.....	18	64	5	843
Texas.....	37	51	.5	954

¹ U. S. Census Bureau Estimates, 1945.

² State Accredited Schools of Nursing, National League of Nursing Education, 1946.

³ Districts are those of the Public Health Service in 1945.

district rank among the lowest fourth of the States in ratio of students enrolled per 100,000 population, and the other 2 States were also producing a less than average number of nurses. It is interesting to note that among the so-called debtor States are the 2 resort States, Florida and California, and such States as thickly populated Rhode Island and midwestern Michigan and Indiana.

Six States which were producing less than the average number of nurses have above average per capita income.⁵ These States are Rhode Island, Idaho, Michigan, California, Wyoming, and Nevada. It is apparent that in general the income level of States has some direct bearing on ability to support nurse education as well as other kinds of education. For example, all of the States in the New Orleans district (which produces the fewest nurses per capita per district—table 1), except Florida, are in the group having the lowest per capita income.

Educational Facilities at Two Levels

From the nurses admitted annually to schools of nursing must come not only the future bedside nurse but also the nurse teacher, supervisor, administrator, and researcher. All States need these categories of nurse personnel, but not all make provision to assure their supply.

It seems reasonable to consider that the student nurse with college preparation will make the greater contribution to her profession and that her basic professional experience must be on a level comparable with college work. Schools of nursing have established high school graduation as a minimum educational admission standard but it is apparent that they have not placed equal emphasis or recognition on standards of professional experience offered the student nurse.

In 1945, 9 percent of all schools of nursing required completion of one or more years of college for admission.⁶ One hundred and thirty-eight (11 percent) of the 1,295 State accredited schools of nursing offered an undergraduate program leading to a degree. Ninety-three percent of students (125,762) were enrolled in diploma programs and 7 percent (8,749) in degree programs. The United States 1945 average ratio was one degree student to each 14 diploma students. Fifteen of the States included in this study had a ratio above the national average. The range is from one degree student to five diploma students in New York State to none in seven States: Arkansas, Delaware, Kentucky, North Dakota, New Mexico, West Virginia, and Wyoming.

⁵ Survey of Current Business, U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, August 1947.

⁶ Facts About Nursing 1945, p. 31.

From the ratios in table 2 it appears that in only two States, New York and Oregon, were as many as 20 percent of the student nurses enrolled in degree programs. A majority of States were not preparing sufficient potential nurse resources to meet population needs for better patient care and to meet the profession's needs for better-prepared instructors, supervisors, head nurses and administrators of nursing schools and nursing services. Two-thirds of the States had either less than 1 student in 14 or no students at all enrolled in degree programs.

It must be noted that a number of the 138 schools with programs leading to a degree also had an accelerated 3-year diploma program for cadet nurses. In many of these schools the number of diploma students far exceeded the number of degree students. For purposes of this paper, it has been considered that the 3-year diploma students enrolled in a school which granted a degree to graduates of the basic nursing program who complete additional college requirements are also potential degree students. The ratio of diploma students to degree students as shown in table 2 may, therefore, be overoptimistic since it is not known how many of the diploma students will complete the college requirements. Although the number of students graduating with a degree from basic programs may not have increased during the war, the number of potential degree candidates enrolled increased considerably.

Table 2. Rank of States by ratio of diploma to degree students ¹ (criterion 2)

United States average.....	14.4	24. Kansas.....	29.4
1. New York.....	5.0	25. Indiana.....	29.7
2. Oregon.....	5.2	26. South Dakota.....	32.1
3. Wisconsin.....	5.9	27. Georgia.....	32.3
4. Washington.....	6.1	28. South Carolina.....	34.1
5. Colorado.....	6.2	29. Illinois.....	35.1
6. Connecticut.....	6.7	30. New Jersey.....	47.2
7. Utah.....	9.7	31. Pennsylvania.....	54.1
8. Minnesota.....	9.9	32. Massachusetts.....	59.1
9. California.....	10.0	33. Idaho.....	94.4
10. Nebraska.....	11.2	34. Maryland.....	96.0
11. Montana.....	11.4	35. Texas.....	101.0
11. Florida.....	11.4	36. Arizona.....	190.5
13. Tennessee.....	12.1	37. Oklahoma.....	195.8
14. Louisiana.....	12.5	38. New Hampshire.....	718.0
15. Rhode Island.....	14.3	39. Alabama.....	932.0
16. Ohio.....	14.7	40. Arkansas.....	0
17. Missouri.....	17.9	40. Delaware.....	0
18. Vermont.....	18.7	40. Kentucky.....	0
19. Virginia.....	19.0	40. North Dakota.....	0
20. Maine.....	20.6	40. New Mexico.....	0
21. Iowa.....	21.3	40. West Virginia.....	0
22. Michigan.....	23.7	40. Wyoming.....	0
23. North Carolina.....	28.6		

¹ State accredited schools of nursing, NLNE, 1946.

Personnel Responsible for Nurse Education

The 1,125 schools reported a total of 20,134 administrative and instructional personnel⁷ responsible in the home school for the preparation of the 130,721 students enrolled in 1945. This represented a national average ratio of 1 person responsible for administration and instruction for every 6.5 students enrolled. Because of their importance in the education of nurses, the dietitians were included as administrative and instructional personnel in the 1,125-school study. No doctors or other educators are included in this total. More than half of the schools had a total student enrollment of less

Table 3. *State ratios of student nurses per instructor and per instructor with various preparation (criterion 3-6)*

	Column I	Column II	Column III	Column IV
	Students per instructor	Students per instructor with degree	Students per instructor with advance preparation	Students per instructor with advance preparation in nurse education
United States average	6.5	22.9	16.5	33.3
Alabama.....	4.1	20	14	25.0
Arizona.....	11.2	36	47	157.0
Arkansas.....	6.1	37	14	18.6
California.....	8.2	17	21	35.7
Colorado.....	7.1	17	18	38.7
Connecticut.....	5.6	19	13	48.7
Delaware.....	5.2	41	11	15.5
Florida.....	5.6	25	10	16.6
Georgia.....	8.0	34	22	33.9
Idaho.....	6.0	21	17	43.5
Illinois.....	5.8	21	13	26.5
Indiana.....	8.5	27	19	34.9
Iowa.....	7.0	24	12	20.4
Kansas.....	5.9	23	14	22.8
Kentucky.....	5.6	33	16	34.7
Louisiana.....	7.4	29	13	19.3
Maine.....	7.0	25	20	35.8
Maryland.....	5.7	22	13	26.7
Massachusetts.....	6.9	27	20	59.8
Michigan.....	7.9	26	20	38.6
Minnesota.....	6.8	19	16	24.7
Missouri.....	6.5	18	21	48.3
Montana.....	10.5	26	21	39.2
Nebraska.....	7.9	19	14	30.2
New Hampshire.....	5.1	24	9	16.2
New Jersey.....	7.2	20	27	83.4
New Mexico.....	5.7	13	9	11.4
New York.....	5.4	19	15	25.9
North Carolina.....	5.6	28	17	59.1
North Dakota.....	7.7	26	17	37.7
Ohio.....	5.9	21	18	35.5
Oklahoma.....	5.5	26	19	56.6
Oregon.....	6.2	15	11	27.2
Pennsylvania.....	6.9	25	22	53.5
Rhode Island.....	9.5	23	23	31.8
South Carolina.....	6.2	43	32	85.8
South Dakota.....	7.6	30	13	36.2
Tennessee.....	9.4	31	24	54.9
Texas.....	7.5	30	16	32.2
Utah.....	10.3	34	20	43.7
Vermont.....	6.2	64	10	13.2
Virginia.....	3.9	20	11	19.7
Washington.....	6.9	18	15	25.8
West Virginia.....	7.6	37	21	65.2
Wisconsin.....	7.8	18	15	32.3
Wyoming.....	3.9	25	11	37.0

⁷ These persons are sometimes referred to also as "instructors" or "faculty."

than 100 students. Schools with the smallest number of students enrolled had the fewest students per instructor while the number of students per instructor increased gradually with the size of the school but not necessarily in proportion to the enrollment. This indicates increasing economy of instructional personnel as enrollment increased.

In table 3, column I, which shows by State the ratio of students per instructor, the range is from 4 students per instructor in Wyoming, Virginia, and Alabama, to 11 per instructor in Montana and Arizona. In this table the States having a large proportion of small schools show a tendency to have ratios of students per instructor comparable to States with a higher percentage of large schools. The cost to schools collectively of maintaining a State ratio of one person for administrative and instructional purposes to every four to six students enrolled is a matter that deserves thoughtful consideration.

Approximately 60 percent of the 1,099 directors of school and/or nursing service had more than two functions. Supervisors and instructors in the clinical areas tended to have two functions only, namely, teaching and supervision in one clinical field, whereas the instructors in social and biological sciences and nursing arts showed a greater tendency to have three or more functions. Frequently persons in the latter three categories carried the additional responsibility of assistant director of school and/or nursing service, educational director and supervisor of the student health program. Thirty-five percent of all personnel responsible for the educational programs had less than 5 years of experience since graduation, 56 percent had been in their present position for less than 3 years, and 40 percent for less than 18 months.

Educational Standards for Faculties

It is expected that persons in administrative and teaching positions will be among the best prepared in the profession. There has been a tendency on the part of schools of nursing to consider possession of a degree from any field in any college or university as complying with the recommendations of the National League of Nursing Education for faculty standards. This tendency has undoubtedly encouraged many nurses to seek undergraduate preparation in any liberal arts college which will grant credit for the basic nursing program. When the college was not wisely selected, many nurses have later found that much of their undergraduate work must be repeated before matriculation in colleges offering advanced degrees was permissible. It has not been possible to distinguish from information submitted by the schools the kind of college program from which the degrees were received.

The 1,125 schools reported 845 persons (4 percent) with a degree above the bachelor, and 330 (2 percent) who were working for a higher

degree. There were 4,545 (23 percent) of the personnel who had completed the baccalaureate degree, and 5,468 (27 percent) who were working for a baccalaureate degree. It was reported that 2,263 persons (11 percent) had no college experience. Information requested was not given for 6,683 persons (33 percent). Where information was omitted, it is probable that no advanced preparation could be reported.

This means that at least 44 percent of the 20,134 persons engaged in the education of students and the administration of the educational program had no college experience. Only 29 percent of the 20,134 persons reported as holding responsible positions had a college degree of any kind. Included in this 29 percent is a high percentage of the 1,094 instructors of nutrition and diet therapy for whom a baccalaureate degree is a requirement for practice. Also included are persons who have graduated from a basic nursing program which led to a degree and who have had no additional preparation, and persons having a degree in general education but no preparation in nursing education. Table 4 shows the geographic distribution of administrative and instructional personnel by percent with various educational backgrounds. The States are ranked according to percent of personnel having a baccalaureate degree. Table 3, column II, shows the ratio of students per instructor with baccalaureate or higher degree in various States.

The number of students per instructor with degree ranged from 13 in New Mexico (1 school and 91 students) to 64 in Vermont (7 schools and 510 students). The national average number of students for each instructor with degree was 1 to 23.

It is necessary to consider the variety of activities or functions⁸ carried out by the 20,134 persons whom the 1,125 schools have reported as administrative and instructional personnel in order to clarify their educational responsibility. One-fourth (5,023) of these persons were classified by the schools as being primarily responsible for administration of nursing school and nursing service. Included in this group were the directors and assistant directors of schools of nursing, directors and assistant directors of nursing service in hospitals with which schools of nursing are associated, and 20 nurse counselors in charge of student guidance and counseling programs. The remaining persons were listed by the schools as having educational responsibilities either in the classroom, the clinical areas of hospitals, or student health services.

Over half of all persons were reported as having one function only. Eighty-six percent of the 20,134 persons had less than three functions. In Massachusetts, Kansas, Tennessee, North Dakota, and Rhode Island, 10 to 13 percent of all personnel were responsible for three

⁸ Administrative, teaching, and nursing service responsibilities only.

Table 4. Geographic distribution of administrative and instructional personnel—home school faculties only (percent of personnel by amount of education rank of States by percent of personnel having bachelor's degree)

	Total number persons	Has bachelor's degree	Working for bachelor's degree	Has higher degree	Working for higher degree	No college experience	No information given
United States total	20, 134	23	27	4	2	11	33
1. California	572	42	29	4	2	6	16
2. Wisconsin	335	38	30	4	1	8	19
3. Colorado	212	37	33	4	0	15	10
4. Oregon	194	36	14	4	3	6	38
5. Rhode Island	80	35	44	5	1	1	14
6. Washington	402	35	11	3	1	14	36
7. Nebraska	177	33	21	7	1	19	20
8. Minnesota	690	31	33	4	1	7	24
9. Montana	116	31	36	9	-----	12	11
10. New Mexico	16	31	31	6	6	25	-----
11. Missouri	481	27	28	7	1	7	29
12. Iowa	431	27	20	2	1	23	27
13. Indiana	379	27	35	3	1	8	26
14. Tennessee	233	26	17	3	-----	8	45
15. Maine	143	26	22	1	1	9	41
16. Arizona	42	26	33	5	-----	5	31
17. North Dakota	151	25	19	4	1	9	43
18. Idaho	87	25	20	2	1	6	46
19. Michigan	598	24	24	5	1	11	35
20. Illinois	1, 667	23	23	3	1	14	36
21. South Dakota	204	23	30	2	-----	15	29
22. Pennsylvania	1, 957	22	24	4	2	11	37
23. Louisiana	251	22	28	4	-----	8	38
24. Ohio	1, 386	21	23	4	2	11	39
25. Maryland	392	21	20	4	1	13	42
26. Florida	159	21	19	1	1	27	31
27. Massachusetts	1, 044	20	34	4	2	6	35
28. Kansas	357	20	18	6	-----	20	36
29. New York	2, 405	19	37	6	3	10	25
30. Texas	565	19	38	4	1	13	24
31. Oklahoma	217	19	16	2	-----	34	29
32. West Virginia	197	19	18	2	-----	6	55
33. New Jersey	700	18	38	5	1	12	25
34. North Carolina	393	17	13	2	2	9	58
35. Utah	98	17	58	12	1	-----	11
36. Georgia	256	16	29	7	-----	6	41
37. Alabama	229	16	17	3	1	16	47
38. Wyoming	19	16	21	-----	-----	26	37
39. Virginia	587	15	21	2	2	14	45
40. Kentucky	234	15	31	2	-----	10	42
41. New Hampshire	161	15	20	4	2	11	47
42. Arkansas	109	15	21	1	1	28	34
43. Connecticut	490	14	34	7	8	7	29
44. Delaware	102	13	43	-----	-----	21	24
45. South Carolina	237	10	10	2	2	8	68
46. Vermont	82	7	49	2	-----	5	37

functions while in Maine, Delaware, New Hampshire, Wyoming, Arizona, and New Mexico, 10 to 13 percent had four functions.

In some schools one nurse was responsible for more than four functions. Occasionally one person taught practically everything in the curriculum. Twenty states had 1 percent of their personnel engaged in more than four functions. Missouri, Washington, North Carolina, Indiana, Kentucky, Oregon, New Hampshire, and Arizona reported 2 percent; Maine, Kansas, and Utah reported 3 percent; North Dakota 4 percent; and Wyoming 5 percent with more than four functions.

An example of the educational preparation of certain key instructors of nursing is shown in table 5. Instructors of nursing arts, psychia-

try,⁹ and medical nursing appear to have been somewhat better prepared academically for their positions. However, less than a third of the nursing arts instructors had had advanced preparation in nursing education, although 42 percent had a degree. Eleven percent had had some advanced preparation in their field of work. Only 18 percent of the instructors in obstetric nursing had a degree, but 38 percent had had some preparation in their specialty beyond the basic program. Of the 365 nurse instructors of psychiatric nursing, 54 percent had a degree, 27 percent had some advanced preparation, and 21 percent had done some advanced work in psychiatry. Thirty percent of the 609 instructors in pediatric nursing were college graduates and 37 percent had some advanced preparation. Surgical nursing instructors had 8 percent fewer degrees than instructors in medical nursing but both groups had approximately the same percent of advanced preparation.

Table 5. Qualifications and work load of instructors of nursing arts, medicine, surgery, obstetrics, pediatrics, and psychiatry (home school only)

	Field of instruction in nursing					
	Nursing arts	Medicine	Surgery	Obstetrics	Pediatrics	Psychiatry
Total number of instructors	1,851	1,438	1,688	1,058	609	365
Percent by amount of education:						
No college experience.....	5	6	8	19	13	6
Working for a bachelor's degree.....	40	34	36	36	41	26
Has a bachelor's degree.....	36	39	31	16	26	40
Working for higher degree.....	3	2	2	1	2	6
Has a higher degree.....	3	5	4	1	-----	9
No information given.....	13	13	19	27	17	14
Percent by types of advanced preparation:						
None.....	1	1	1	2	1	1
Some in nursing education.....	30	29	26	18	18	27
Some in present field of work.....	11	13	15	38	37	21
Some in other fields of work.....	5	5	4	3	3	4
No information given.....	53	51	54	39	41	47

Educational Effort of Faculties

With approximately 98 percent of all schools of nursing established as hospital schools and providing for the most part no liberal arts background for their students, it is obvious that in order to obtain broad preparation comparable to that of graduates of other professional schools, considerable initiative and effort on the part of most graduate nurses is required. Preparation for nursing in a basic college program is costly but education obtained following completion of the basic nursing program is much more costly since it requires

⁹ Note that these are "home school" instructors teaching theory.

not only the high cost of tuition, fees, and maintenance, but loss of salary during what might be financially productive years. Even when a graduate nurse practiced for several years, it has usually been possible for her to save only a portion of the cost of obtaining a baccalaureate degree. A fairly large loan has often been necessary to aid her during the years of study.

The nurses who have made this educational effort, and organizations and institutions which have been farsighted enough to lend them assistance during periods of study, deserve particular commendation for their contribution to improved nursing service and education.

It has already been pointed out that the situation at its best was not good in 1945 as far as completion of a college program by administrative and instructional personnel was concerned. It was considerably better, however, when consideration was given to the number of persons who were making the attempt to secure needed preparation for doing a better job. In order to show the best possible picture of the 20,134 persons included in the 1,125-school study, column III, table 3, has been prepared to show the ratio of students per instructor with any advanced preparation, basic degree, higher degree, nursing education, in present or other field of work. The United States average ratio is 16.5, whereas it will be recalled that the average ratio of students per instructor with a degree was 22.9. The shift in rank of States in these two criteria deserves consideration. Vermont, for instance, which had the fewest instructors with degrees in column II is fourth highest in column III, South Carolina, on the other hand, is in forty-fifth place in both criteria.

In some States there was concerted effort during the war period to improve the preparation of the personnel in schools of nursing. Short courses, workshops and institutes, and postgraduate courses in clinical areas were among opportunities provided. Leaves of absence for special study became more frequent and more possible with financial assistance made available by the Federal Government under the Training for Nurses Act of 1941 and later under Public Law 74 (the Bolton Act). Some States made more effort than other States to provide these opportunities for their faculty. It might be considered, therefore, that States as well as individuals put forth educational effort in order to produce the ratios of students to instructor with advanced preparation shown in table 3, column III.

Table 6 shows the distribution of personnel with some kind of advanced preparation in schools admitting large and small classes. It will be noted that comparable effort to secure better preparation had been made by personnel in all categories of schools. The struggle involved in attempting to provide good instruction in 1,300 schools of nursing is obvious.

Table 6. Personnel by type of advanced preparation and average admissions per class

Average number of students per class admitted to school	Number of schools	Number of persons	Percent of personnel by type of advanced preparation				
			None	Some in nursing education	Some for present field of work	Some for other field of work	No information given
1-9.....	139	1,598	5	19	15	5	56
10-19.....	378	5,220	3	21	19	3	54
20-29.....	317	5,508	1	20	18	4	57
30-39.....	165	3,581	1	16	16	3	63
40-49.....	65	1,766	2	16	14	2	66
50.....	57	2,398	-----	24	11	3	62
None ¹	4	63	-----	6	33	6	54
Total.....	1,125	20,134	2	20	17	3	59

¹ In process of closing.

Advanced Professional Education of Faculties

Advanced professional preparation is an essential criterion for estimating nurse resources for provision in all fields of trained leadership, for such important professional activities as research in both nursing service and nursing education, and for intelligent functioning as a representative of the profession in community, State, national, and international affairs.

Table 3, column IV, shows the ratio of students per instructor with advanced preparation in nurse education. The United States average was 33 students per instructor. It is apparent in table 7 that slightly more persons who were engaged in administration and teaching had obtained advanced preparation in fields other than nurse education.

The number of programs for advanced nursing education was more limited prior to 1945, the period during which these instructors were preparing themselves for the positions they held. The advanced programs available were unevenly distributed geographically. This fact as well as limited scholarships and low salary scale in effect in various States should undoubtedly be taken into consideration when studying the State ratios in table 3.

Estimated Quality of Nurse Education Programs

It is difficult to evaluate the quality of an educational program objectively. In evaluating the quality in the various States, it is important to give consideration to the effectiveness of planning and administration of educational programs. Evaluations of the 1,125 schools participating in the Federal Nurse Training Program under the Bolton Act were made by consultants in the Division of Nurse Education.¹⁰ These evaluations took into consideration both sub-

¹⁰ Confidential material on file with Public Health Service, Office of Nurse Education and Resources.

Table 7. *Census of personnel having various kinds of preparation*

	Personnel	Degree	No degree	Preparation in nursing education	No preparation
United States total	20, 134	5, 720	14, 414	3, 928	4, 000
Alabama.....	229	43	186	38	30
Arizona.....	42	13	29	3	7
Arkansas.....	109	18	91	36	12
California.....	572	276	296	132	95
Colorado.....	212	88	124	39	44
Connecticut.....	490	141	349	56	159
Delaware.....	102	13	89	34	15
District of Columbia.....	174	57	117	46	43
Florida.....	159	36	123	54	35
Georgia.....	256	60	196	60	31
Idaho.....	87	25	62	12	18
Illinois.....	1, 667	452	1, 215	365	399
Indiana.....	379	117	262	92	79
Iowa.....	431	128	303	147	112
Kansas.....	357	92	265	93	55
Kentucky.....	234	40	194	38	42
Louisiana.....	251	65	186	96	43
Maine.....	143	40	103	28	21
Maryland.....	392	101	291	83	84
Massachusetts.....	1, 044	265	779	120	244
Michigan.....	598	181	417	122	120
Minnesota.....	690	249	441	191	111
Mississippi.....	41	8	33	-----	6
Missouri.....	481	171	310	65	82
Montana.....	116	47	69	31	26
Nebraska.....	177	72	105	46	51
Nevada.....	-----	-----	-----	-----	-----
New Hampshire.....	161	35	126	51	37
New Jersey.....	700	175	525	60	124
New Mexico.....	16	7	9	8	2
New York.....	2, 405	689	1, 716	504	374
North Carolina.....	393	79	314	37	91
North Dakota.....	151	45	106	31	39
Ohio.....	1, 386	384	1, 002	230	228
Oklahoma.....	217	46	171	21	41
Oregon.....	194	82	112	44	68
Pennsylvania.....	1, 957	535	1, 422	252	350
Rhode Island.....	80	33	47	24	9
South Carolina.....	237	34	203	17	29
South Dakota.....	204	52	152	43	80
Tennessee.....	233	70	163	40	52
Texas.....	565	139	426	131	135
Utah.....	98	30	68	23	27
Vermont.....	82	8	74	38	13
Virginia.....	587	114	473	117	98
Washington.....	402	158	244	107	78
West Virginia.....	197	41	156	23	50
Wisconsin.....	335	144	191	81	96
Wyoming.....	19	3	16	2	5
Puerto Rico.....	82	15	67	17	10

jective and objective information about the schools. Criteria for these evaluations were as follows:

1. Completeness of experience offered (number and kinds of clinical experience and courses included for all students, and the variety of patients—daily average patient census in each clinical field as well as total daily average).

2. Quality of patient care practiced—ratio of general staff and subsidiary workers to students and patients, approval of facilities by appropriate approval agencies (State Board of Nurse Examiners, American College of Surgeons, American Medical Association, confidential reports of visits to schools).

3. Number, qualifications, stability and work of school administrative and instructional staffs, including clinical instructors. Edu-

cational facilities, including laboratories (science, nutrition, and nursing arts), classrooms (school and hospital head nurse units), conference rooms, libraries.

4. Quality and amount of instruction in principles and their integration in practice.

5. Conditions of living and learning.

Table 8. Rank order of States by consultants rating weighted according to percent of schools in each category (criterion 7)

	Total schools	Percent of schools by ratings					Average rating for State (weighted) by percent of schools in each category scale 1-5
		E 1	G 2	F 3	P 4	VP 5	
United States total	1, 125	0. 7	12. 3	57. 4	22. 8	6. 8	3. 228
1. Connecticut.....	19	5	16	79	.....	.....	2. 74
2. New York.....	105	1	27	60	11	1	2. 84
3. California.....	35	6	20	57	17	.....	2. 84
4. Massachusetts.....	58	.....	24	62	10	4	2. 94
5. Maryland.....	16	6	.....	88	6	.....	2. 94
6. Minnesota.....	23	.....	35	43	13	9	2. 96
7. Missouri.....	27	.....	18	67	15	.....	2. 97
8. New Mexico.....	1	.....	.....	100	.....	.....	3. 00
9. Louisiana.....	14	7	7	72	7	7	3. 00
10. Georgia.....	14	.....	14	72	14	.....	3. 00
11. South Dakota.....	13	.....	31	46	15	8	3. 00
12. Vermont.....	7	.....	28	44	28	.....	3. 00
13. Texas.....	35	.....	11½	74	11½	3	3. 06
14. Pennsylvania.....	110	.....	14	65	20	1	3. 08
15. Maine.....	10	.....	20	60	10	10	3. 10
16. Ohio.....	61	2	15	59	16	8	3. 13
17. New Jersey.....	41	.....	10	71	14	5	3. 14
18. Rhode Island.....	6	.....	17	50	33	.....	3. 16
19. Nebraska.....	12	.....	8	75	9	8	3. 17
20. Colorado.....	12	.....	25	33	42	.....	3. 17
21. Florida.....	10	.....	.....	80	20	.....	3. 20
21. Montana.....	10	.....	.....	80	20	.....	3. 20
23. Indiana.....	24	.....	13	58	21	8	3. 24
24. Oregon.....	11	.....	18	46	27	9	3. 27
25. Wisconsin.....	23	.....	4	66	26	4	3. 30
26. Michigan.....	34	.....	3	68	23	6	3. 32
27. Washington.....	22	4	5	50	36	5	3. 33
28. Tennessee.....	14	.....	14	50	22	14	3. 36
29. Oklahoma.....	13	.....	.....	77	8	15	3. 38
30. West Virginia.....	17	.....	6	47	47	.....	3. 41
31. Alabama.....	15	.....	7	60	13	20	3. 46
32. North Dakota.....	15	.....	.....	60	33	7	3. 47
33. Iowa.....	27	.....	.....	67	18	15	3. 48
34. Delaware.....	6	.....	17	50	.....	33	3. 49
35. Illinois.....	86	.....	9	42	30	19	3. 59
36. Arizona.....	5	.....	.....	40	60	.....	3. 60
37. New Hampshire.....	13	.....	.....	54	31	15	3. 61
38. Virginia.....	28	.....	7	39	40	14	3. 61
39. Kentucky.....	14	.....	.....	43	50	7	3. 64
40. Utah.....	6	.....	.....	33	67	.....	3. 67
41. North Carolina.....	31	.....	3	35	49	13	3. 72
42. Kansas.....	32	.....	.....	31	60	9	3. 78
43. South Carolina.....	15	.....	.....	33	47	20	3. 87
44. Idaho.....	7	.....	.....	14	72	14	4. 00
45. Arkansas.....	8	.....	.....	12½	75	12½	4. 00
46. Wyoming.....	2	.....	.....	.....	.....	100	5. 00

Evaluations are shown on a 5-point scale in table 8: Excellent, good, fair, poor, and very poor. In order to rank the States according to these evaluations, a weighting of 1 to 5 was used and States arranged in excellence according to lowest score. The United States average rating was 3.23. Twenty States had a higher rating.

Table 9 is included to show relationships between consultants ratings and size of the student enrollment. Eighteen percent of the schools with a student enrollment of less than 100 were in the good and excellent categories while 2 percent of the schools with an enrollment above 200 were rated as poor or very poor. The highest percents of poor and very poor schools are among those having an enrollment of less than 100 students. Six hundred and two of the 1,125 schools studied were in this category.

Table 9. *Rating in relation to enrollment students admitted January 1, 1942-June 30, 1945 and remaining on June 30, 1945*

Rating	Number and percent of schools of each number of students enrolled											
	Total		0-49		50-99		100-199		200-299		300-999	
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
Excellent and good.....	147	13.1	6	3.1	21	5.1	65	16.4	27	32.1	28	66.7
Fair.....	646	57.4	80	41.5	236	57.7	267	67.3	50	59.5	13	31.0
Poor and very poor.....	332	29.5	107	55.4	152	37.2	65	16.4	7	8.3	1	2.4
Total.....	1,125	100.0	193	100.0	409	100.0	397	100.0	84	99.9	42	100.1

Educational Achievement of the Educational System Product

There are rather wide variations in State requirements for nurses' licenses. In some States a reason frequently given by directors of schools of nursing for high State board failure during the past few years was adoption of the State board test pool for licensure examination. The test pool was started in January 1944 and by December 1945, 25 States were using some or all of the tests available.¹¹

Table 10 indicates that in seven States 75 to 100 percent of the schools participating in the Cadet Nurse Corps program reported that 91 to 100 percent of all of their graduating students passed State board examinations in 1944-45. In 17 States, less than 50 percent of all participating schools reported that as few as 10 percent of their students failed the examinations. It will be observed that some States with high State board failure stand high in other criteria.

It is understandable that standards within a State will be in accord with the situation as it exists in the State at any given time. It may be expected therefore that State licensure examinations take into consideration the educational standards of the schools within the State and that a candidate's ability to pass the examination with a high or low standing is an indication of ability in nursing as recognized within the given State. States exercise their prerogative for main-

¹¹ American Journal of Nursing, vol. 45, No. 12, December 1945, p. 1036.

tenance of their own standards for nurse practice through requirements established for licensure of out-of-State nurses.

It is believed that the educational achievement (performance in licensure examination) of the graduates of the schools within a State as determined by the respective State boards of nurse examiners is an important criterion in evaluating the educational program of a State. The degree of success of graduates on examinations such as those prepared for the test pool would undoubtedly be an interesting measure of educational achievement for comparison between States as well as a valuable means of estimating strengths and weaknesses in various curricula.

Table 10. Rank of States by percent of schools reporting that 91-100 percent of their students passed State board examinations in 1945 (criterion 8)

	Percent of high student achievement schools		Percent of high student achievement schools
United States total	57.6	23. Iowa.....	59
1. Utah.....	100	24. Texas.....	57
2. Wyoming.....	100	25. Tennessee.....	57
3. California.....	86	26. Idaho.....	57
4. Oklahoma.....	85	27. New Hampshire.....	54
5. Connecticut.....	84	28. Michigan.....	53
6. Missouri.....	81	29. New Jersey.....	51
7. Montana.....	80	30. Virginia.....	50
8. Nebraska.....	75	31. Indiana.....	50
9. South Carolina.....	73	32. Washington.....	50
10. Pennsylvania.....	71	33. Kentucky.....	50
11. Illinois.....	70	33. Louisiana.....	50
12. Minnesota.....	70	35. New York.....	45
13. Alabama.....	67	36. Massachusetts.....	45
13. North Dakota.....	67	37. Georgia.....	43
15. Colorado.....	67	38. Vermont.....	43
16. Delaware.....	67	38. West Virginia.....	41
16. Rhode Island.....	67	40. Florida.....	40
18. Kansas.....	63	41. Ohio.....	39
19. Arkansas.....	63	42. South Dakota.....	31
20. North Carolina.....	61	43. Wisconsin.....	30
21. Maine.....	60	44. Maryland.....	6
22. Arizona.....	60	45. Oregon.....	0
		46. New Mexico.....	0

Apparent Relationships of States

The 20,134 persons rated in criteria 3, 4, 5, and 6 range from head nurse with 3-year basic preparation to deans of collegiate schools having a Ph. D. degree. There is undoubtedly some overlapping since it was not always possible to determine and tabulate from information submitted by the schools all combinations of preparation and responsibility of all persons in the various administrative and educational positions. In order to make as fair an evaluation as possible of number and preparation of faculty and not overweight the evaluation table (table 11) with four criteria pertaining to faculty, an average rank for each State in criteria 3 through 6 was sought. This has the effect, when determining an apparent over-all rank for States in table 12, of giving a value of one to each State for apparent ability

in each of the following: Provision for education as shown in ratio of degree to diploma students per 100,000 population (column I) number and preparation of faculty provided (column II), quality of over-all curriculum (column III), and educational achievement of the student as indicated in performance on State licensure examinations (column IV).

In developing an evaluation table, following application of quality criteria 2 through 8 to available data, interesting variations in rank order of States become apparent. It must be emphasized again that this is not an attempt to provide a complete picture of nursing education in the United States. It is a picture of the programs in 1,125

Table 11. *Relative rank of States in evaluation of educational program (criteria 2 through 8)*

	Column I	Column II	Column III	Column IV	Column V
	Ratio ¹ degree to diploma student	Average rank faculty (criteria 3-6)	Consultant's rating (weighted by percent schools in each category)	Percent high State board achieve- ment	Apparent over-all rank
Connecticut.....	6	16	1	5	1
Minnesota.....	8	13	6	12	2
California.....	9	27	3	3	3
New York.....	1	7	2	35	4
Missouri.....	17	26	7	6	5
Nebraska.....	11	19	19	8	6
Colorado.....	5	23	20	15	7
Washington.....	4	13	27	32	8
Florida.....	12	4	4	40	9
Louisiana.....	14	20	10	33	9
Oregon.....	2	6	24	45	9
Montana.....	10	40	21	7	12
Illinois.....	29	8	35	11	13
Rhode Island.....	15	34	18	16	13
Vermont.....	18	17	13	38	15
Alabama.....	39	5	31	13	16
Maine.....	20	32	16	21	17
Virginia.....	19	2	38	30	17
Iowa.....	21	13	33	23	19
Utah.....	7	42	40	1	19
Pennsylvania.....	31	35	15	10	21
Wisconsin.....	3	20	25	43	21
Maryland.....	34	9	5	44	23
Ohio.....	16	18	17	41	23
Kansas.....	25	10	42	18	25
New Mexico.....	40	1	9	46	26
Oklahoma.....	36	27	29	4	26
Delaware.....	40	10	34	16	28
Wyoming.....	40	12	46	2	28
Texas.....	35	30	14	24	30
New Hampshire.....	38	3	37	27	31
Massachusetts.....	32	37	4	36	32
South Dakota.....	26	31	12	42	33
Tennessee.....	13	45	28	25	33
Michigan.....	22	37	26	28	35
North Carolina.....	23	29	41	20	35
Georgia.....	27	39	11	37	37
Indiana.....	24	36	23	31	37
New Jersey.....	30	41	18	29	39
North Dakota.....	40	33	32	13	39
South Carolina.....	28	42	43	9	41
Arkansas.....	40	20	45	19	42
Idaho.....	33	23	44	26	43
Kentucky.....	40	25	39	33	44
Arizona.....	37	46	36	22	45
West Virginia.....	40	44	30	39	46

¹ From Facts About Nursing, 1946, and U. S. Census estimate, 1945.

schools of the 1,313 which had approval from July 1, 1944, to June 30, 1945. If similar information had been available for all schools, there might be considerable change in the position of States in relation to each other in the various tables. It is interesting to consider, for instance, what places in the tables North Carolina, West Virginia, Alabama, New York, and Massachusetts would have assumed if all schools in these States had been included in the study.

Examples of the influence of degree programs within some States may be observed in Utah and Florida. In Utah, although schools of

Table 12. Student nurses enrolled 1944-45 and graduated 1946—States arranged in order of apparent over-all rank in quality criteria

Col. I	Col. II	Col. III	Col. IV	
State by rank in criteria 2-8	Criterion 1 student nurses per 100,000 population	Students graduated 1946 ¹	Percent graduates from States	
	Average: 102	Total: 36, 195	-----	
Connecticut.....	175	811	} 31	
Minnesota.....	203	1, 109		
California.....	55	1, 270		
New York.....	126	4, 234		
Missouri.....	94	937		
Nebraska.....	122	329		
Colorado.....	149	379		
Washington.....	142	668		
Florida.....	44	254		
Louisiana.....	88	539		
Oregon.....	128	314		
Montana.....	213	306		
Illinois.....	122	2, 567		
Rhode Island.....	99	207		
Vermont.....	171	178		
Alabama.....	33	311	} 30	
Maine.....	132	305		
Virginia.....	81	667		
Iowa.....	126	804		
Utah.....	135	243		
Pennsylvania.....	153	4, 043		
Wisconsin.....	109	768		
Maryland.....	114	694		
Ohio.....	120	2, 221		
Kansas.....	114	621		
New Mexico.....	15	19		
Oklahoma.....	39	236		
Delaware.....	187	189		
Wyoming.....	26	14		
Texas.....	52	987		} 24
New Hampshire.....	159	179		
Massachusetts.....	169	1, 964		
South Dakota.....	179	297		
Tennessee.....	69	582		
Michigan.....	90	1, 229		
North Carolina.....	73	715		
Georgia.....	55	445		
Indiana.....	95	884		
New Jersey.....	117	1, 347		
North Dakota.....	216	320		
South Carolina.....	65	310		
Arkansas.....	29	128		
Idaho.....	95	120		
Kentucky.....	49	353		
Arizona.....	60	104	} 15	
West Virginia.....	92	513		
District of Columbia.....	} Not included in study {	248		} -----
Mississippi.....		176		

¹ Facts About Nursing, 1947, p. 20.

nursing have an association with the universities, each school of nursing recruits and graduates its own students. Five of Utah's six schools are classified as giving degree programs.¹² Although Florida stands eleventh in ratio of degree to diploma students (table 2), there is no degree program for white nursing students in this State.

Persons familiar with the educational programs in individual States will be able to recognize specific factors which influence the standing of the States in the evaluation table.

Quantity and Quality of Resources

The number of students per 100,000 population being prepared in each State has already been discussed. Of the 24 States having above the United States average number of students enrolled, seven—Minnesota, Connecticut, Colorado, Washington, Oregon, New York, and Nebraska—stand in the top fourth of the States in quality of educational program. California which has an apparent over-all rank of 3 in quality of educational program ranks 35 in number of students enrolled per 100,000 population. It would appear that such States as California with good educational facilities at their command and with large population increases, should be preparing more than the average number of nurses.

In table 12, column IV, it will be noted that approximately 31 percent of all students graduated in 1946 had been enrolled in States ranking in the upper fourth in quality criteria used in this study. Thirty percent of students graduated from States falling in the second quarter, 24 percent from those in the third quarter, and 15 percent from those ranking in the lowest quarter. Three of the States falling in the lowest quarter—New Jersey, North Dakota, and West Virginia—graduated higher than the average number of students in 1946. Among the States falling in the lowest quarter following application of the quality criteria are States having high maternal and infant mortality and a high death rate from communicable diseases¹³ as well as low income per capita.¹⁴

The students graduated in 1946 were a product of the educational programs in effect in schools of nursing at the time the 1,125-school study was made. They constituted the largest number of students graduating within any 12 months in nursing history.¹⁵ The contribution they will make to their profession will be affected by the preparation they have received for accepting and undertaking the responsibilities of graduate nurses.

¹² State accredited schools of nursing, National League of Nursing Education, 1946, p. 68.

¹³ Federal Security Agency, Public Health Service, Vital Statistics—Special Reports, vol. 27, July 24, 1947, pp. 41-45.

¹⁴ Survey of Current Business, Department of Commerce, August 1947.

¹⁵ National League of Nursing Education, Department of Studies, American Journal of Nursing, March 1947, p. 185.

Summary and Conclusions

Data presented here indicate that there was an average of approximately 1 student nurse per 1,000 population enrolled in schools of nursing during the peak enrollment period 1944-45, and that half of the States in the United States were preparing less than this number. This average for professional nurse preparation must be increased considerably if the desired goal of 1 nurse (graduate and student) to 280 persons is to be reached, or plans for supplementary services must be developed.

Economic status of States apparently has some direct bearing on ability to produce nurses. However, at least 6 States having above average per capita income are preparing less than 1 student nurse per 1,000 population.

Two-thirds of the States had in 1944-45 less than 1 student in 14 or no students at all (the case in 7 States) enrolled in programs leading to an academic degree. To meet the need for better patient care and to provide for better prepared instructors, administrators, and leaders in nursing, this ratio is far too small. In no State were more than one-fifth of the students enrolled in degree programs. The limited number and distribution of educational programs available to nursing students in institutions of higher learning is a deterring factor in many States.

The average ratio of nurse administrators and instructors to students was 1 to 6.5. States with a high percentage of small schools in general had a ratio comparable to those having larger schools. For the country as a whole, however, the number of students per instructor increased with the size of the school. Effectiveness and economy in utilization of instructional personnel increased with school size.

Thirty-five percent of all personnel in administrative and teaching positions had had less than 5 years of experience since graduation. Fifty-six percent had been in their position for less than 3 years, 40 percent for less than 18 months. Only 22.5 percent of persons in responsible positions had been in nursing more than 15 years. A high percentage of key instructors had limited background in both education and experience. There can be no doubt that immaturity, inadequate preparation, workload, and limited experience of personnel in responsible positions have seriously handicapped the growth and competence of student nurses and reduced the potential of high quality nursing care available.

Data presented here indicate a definite scarcity of trained leaders and creative thinkers in our schools of nursing. Only 4 percent of the 20,134 administrative and instructional personnel in 1,125 schools

of nursing had a degree above the baccalaureate while 2 percent were working for a higher degree. Twenty-three percent had a baccalaureate degree and 27 percent had some credit toward a first degree. Only 29 percent of all instructional personnel were college graduates. In no State had more than 46 percent of administrative and instructional personnel in schools of nursing completed a college program. When we consider the past and present limitations of the average school of nursing curriculum in such areas as psychiatry, communicable disease, tuberculosis, geriatrics, rural and community and public health nursing, the further educational handicaps of instructional personnel are apparent.

The over-all rating of school programs within the States (table 8) shows no particular tendencies as to excellence in States having many or few schools but gives some indication of the range of quality within a single State. The highest percentage of poor and very poor schools are among those having an enrollment of less than 100 students. More than half of the 1,125 schools studied were in this category.

In 7 States, 75 to 100 percent of the schools reported that 91 to 100 percent of their graduating students passed State board examinations in 1944-45. In 19 States, less than 50 percent of participating schools reported that as few as 10 percent failed the examinations.

This study emphasizes the fact that among other shortages in the field of nursing, there continues to be a serious shortage of well-qualified teachers and administrative and supervisory personnel. While the shortage in terms of persons willing to accept such positions may not appear great, there is obviously a shortage from the standpoint of superior individuals with broad general preparation, advanced professional education, and the qualities of leadership essential to efficient performance.

A first step in providing the kind of nursing care the Nation needs and wants must be provision of the kind of instruction that produces a good nurse citizen. While planning for this, we must bear in mind that the best prepared teacher or educational director cannot function in a situation where the educational program is administered by a person unaware of, or uninterested in, educational needs of students. Both nurse teachers and administrators should be leaders. Student nurses need sound leadership if they are to learn to accept and fulfill their obligation to society as professional women.

There have been many expressions of opinion about the over-educated nurse. There is evidence that the nurse who is a graduate of a basic degree program is in such demand that she is often forced to assume positions of considerable responsibility far too soon. However, she is older, more mature, and better prepared for responsibility than is the graduate of the 3-year program. At the ratio of 1 degree

student to 14 diploma students enrolled in our schools of nursing the college-prepared nurse will be scarce for a long time. As long as this scarcity exists it is quite probable that the graduate of a degree program will continue to be required to accept too much administrative and teaching responsibility too soon.

Some States are producing far too few nurses of all kinds to meet their own needs, confident apparently of drawing nurses from other States to make up their deficit. All States have a responsibility for long-range planning to produce more and better bedside nurses, nurse teachers, administrators and leaders.

It is clear that in future the preparation of professional nurses must be different in character and higher in quality than has been the case in the past. To increase the enrollment of nursing students in schools of nursing giving inadequate preparation will be wasteful of both human and economic resources. To continue to graduate students from such schools as "professional" women is extremely unrealistic. There is evidence that a high proportion of schools of nursing in the States studied are providing an educational program that does not approach the standards considered essential for a profession. In fact, it is quite conceivable that the preparation provided in a good practical nurse school in some States is superior to that which students are receiving in some so-called "professional" schools of nursing. There is much evidence that a high percentage of graduates of present schools of nursing are under- rather than over-educated for their comprehensive responsibilities in the health teams of the Nation. None will question the need for a large though unspecified number of truly professional nurses. This report questions the power of many existing schools to produce these nurses.

Cost of education of the nurse and the cost of nursing care are of vital importance to everyone. The unsoundness of attempting to provide well qualified personnel and satisfactory educational equipment for 1,300 schools of nursing is apparent. There are many unnecessary and costly duplications. It is believed that the evidence presented here emphasizes the wisdom of reducing the number of small schools, and pooling some or all of their resources with those of larger educational and health centers. This pooling, in addition to establishment of more large schools in strategic areas, would provide fewer and better schools, but more and better graduates. These schools would make effective use of qualified personnel and other educational resources for production of better nurses.

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Lebanon Quarantine Notice

The Republic of Lebanon announced October 27, 1948, that certificates of vaccination against smallpox and of inoculation against typhoid fever are now required of all persons entering or leaving Lebanon.

Occurrence of Cercarial Dermatitis in Green Lake, Seattle, Washington¹

By FREDERICK F. FERGUSON, Senior Assistant Sanitarian (R), Public Health Service

The occurrence of cercarial dermatitis at Green Lake, Seattle, marks the second notice on the furcocerous larval form which produces "swimmer's itch" in the Pacific Northwest (2). There is strong evidence that it also sporadically infests Steel Lake near Seattle.

Green Lake is relatively shallow, up to 15 feet deep, and is a clear water lake of approximately 300 acres in area. It is a dual purpose lake used for fishing and swimming, serving thousands of persons in densely populated Seattle. Individuals are presumably affected by the larvae penetrating the epidermis. They suffer an intense itching for several days.

In studies² begun September 1947, the assumption was made that these cercariae are a part of the life cycle of blood flukes inhabiting migratory water fowl or rodents. Since snails serve as the intermediate host (1) a survey of this fauna has been made. Biweekly collections of snails from September to June were taken in order to study the distribution of the vector and to attempt to induce cercarial output under laboratory conditions. The following four snails occur in Green Lake:³

Ancylidae—*Ferrissia caurina*.

Planorbidae—*Menetus cooperi crassilabris* F. D. Baker Syn. *Planorbis opercularis planatus*, *Planorbis callioglyphus*, *Planorbis planulatus*.

Lymnaeidae—*Lymnaea* (*Stagnicola*) *palustris nuttaliana* (Say) Syn. *Galba palustris*.

Physidae—*Physa virginea gabbi* (Trym).

Various laboratory attempts to induce out-of-season cercarial output from snails by means of temperature regulation have failed. The first appearance of fork tailed cercariae from *Physa* maintained at 22.5° C. for 3 weeks coincides with the first authentic reports of dermatitis from lake swimmers during the week of June 14, 1948. Studies on cercarial morphology and mode of skin penetration are in progress. With the cooperation of State and Federal game divisions involved, at the height of this season's epidemic, blood studies in search of the adult schistosomes will be made on the representative water birds and rodents.

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¹ Contribution of Department of Zoology, University of Washington.

² The author has been ably assisted in this work by Charles K. Brown and James C. Robuck of the University of Washington.

³ Snails identified by Walter J. Eyerdam of Seattle.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 4, 1948

The reported incidence of poliomyelitis declined from 524 cases last week to 440 for the current week, as compared with a decline from 366 to 261 for the corresponding week of 1946. The last named figure was the largest reported for a corresponding week of the past 5 years. Only 11 States reported currently more than 10 cases, none showing an increase of more than 6 cases. Only California (157, last week 192) reported more than 32 cases. The total for the year to date is 26,672 cases, as compared with 24,522 for the same period in 1946 and a 5-year median (1943-47) of 13,275.

Of 2,492 cases of influenza reported (last week 2,075, 5-year median 2,951), 4 States, Virginia, South Carolina, Texas, and Arizona, reported 2,096 (last week 1,755). No other State reported more than 89 cases. The total since July 31 (average seasonal low incidence week) is 25,910 as compared with 42,142, the largest number for a corresponding period of the past 6 years, reported in 1945.

A total of 5,393 cases of measles was reported currently (last week 3,763, 5-year median 2,277), of which 3,304 occurred in 8 States—Massachusetts 1,080, Texas 511, Pennsylvania 401, New York 364, Wisconsin 270, Virginia 256, Arkansas 220, and Maryland 202. The total since the week ended September 4 (average low-incidence week) is 26,932, 5-year median 14,873.

One case of psittacosis was reported during the week, in Alabama. No occurrence of anthrax, smallpox, or Rocky Mountain spotted fever was reported during the week.

The current figures for none of the other diseases listed in the following table, and cumulative figures for only Rocky Mountain spotted fever and tularemia, are above the corresponding 5-year medians.

Deaths recorded for the week in 93 large cities in the United States totaled 9,654, as compared with 8,535 last week, 10,096 and 9,716, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945-47) median of 9,945. The total for the year to date is 448,762, as compared with 449,592 for the corresponding period in 1947. Infant deaths during the current week totaled 701, as compared with 598 last week and a 3-year median of 724. The cumulative figure is 32,544, same period last year 35,895.

EAST SOUTH CENTRAL											
Kentucky	10									19	10
Tennessee	11	14	102	3	24	50				18	18
Alabama	19	10	64	1	29	15	3	2	5	3	2
Mississippi *	5	8	14	1	17	8	4		1	2	
WEST SOUTH CENTRAL											
Arkansas	6	89	220		27	9			2	13	1
Louisiana	6	2	20	3	33	7	6		1	2	1
Oklahoma	2	76	61	1	16	22	5			7	3
Texas	18	1,444	511	11	181	29	12		1	86	22
MOUNTAIN											
Montana		9	11		8	24				6	
Idaho	1	52	14		4	16			1	7	
Wyoming			10		6	6					
Colorado	1	20	77	1	16	10	2		2	12	
New Mexico		1	15		21	4			0	8	
Arizona	7	114	40	1	12	4				3	1
Utah *	4	2	173	1	11	9	10			10	
Nevada			1								
PACIFIC											
Washington	1	4	58	2	4	30				17	
Oregon	1	15	181	9	12	21				13	
California	6	7	188	5	22	84			4	58	5
Total	218	2,492	5,393	81	1,140	1,787			26	53	929
Median, 1943-47	347	2,951	2,277	105		2,531			30	67	2,476
Year to date 48 weeks	8,908	164,725	578,346	3,027		70,477			899	13,402	66,816
Median, 1943-47	12,643	211,486	572,427	7,500		128,170			735	4,668	116,257
Seasonal low week ends	{ July 10	{ (30th)	{ (35th)	{ (37th)	{ (11th)	{ (32nd)	{ (36th)	{ (38th)	{ (11th)	{ Mar. 20	{ Oct. 2
Since seasonal low week	4,298	25,910	26,932	591	1,26,322	14,861	6	6	1,2,929	6,893	18,721
Median, 1943-47	6,379	22,196	14,873	1,005		28,180			4,044		

* Period ended earlier than Saturday.
 * New York City and Philadelphia only, respectively.
 * Including cases reported as streptococcal infection and septic sore throat.
 * Including paratyphoid fever, currently reported separately, as follows: Virginia 1, North Carolina 1, South Carolina 2, Georgia 1, Arkansas 1, Colorado 1, salmonella infections reported separately, not included, New York, 6.
 † Correction: Poliomyelitis, Iowa (delayed report) 16 cases; typhoid fever, North Carolina, deducted, 1 case each, weeks ended Nov. 13 and 20.
 Pyloric: Alabama, 1 case.
 Alaska: Scarlet fever 13, streptococcal sore throat 4.
 Territory of Hawaii: Measles 242, paratyphoid fever 1, whooping cough 1.

PLAGUE INFECTION IN YAKIMA COUNTY, WASH.

Under date of November 29, plague infection was reported proved in a pool of 43 fleas from 11 short-tailed meadow mice, *Lagurus curtatus*, trapped November 4 on the Bickelton road 16 miles southwest of Mabton, Yakima County, Wash.; and in a pool of 88 fleas from 60 white-footed mice, *Peromyscus maniculatus*, trapped on the same date in the same locality.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—October 1948.—During the month of October 1948, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence ¹									
	Panama City		Colon		Canal Zone		Outside the zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox.....	3	-----	-----	-----	1	-----	-----	-----	4	-----
Diphtheria.....	1	-----	-----	-----	-----	-----	-----	-----	1	-----
Encephalitis (un-specified).....	-----	2	-----	-----	-----	-----	-----	-----	-----	2
Malaria ²	1	-----	4	-----	10	-----	163	1	178	1
Measles.....	1	-----	-----	-----	-----	-----	2	-----	3	-----
Meningitis (un-specified).....	1	1	-----	1	-----	-----	-----	1	1	3
Mumps.....	1	-----	-----	-----	6	-----	-----	-----	7	-----
Pneumonia.....	-----	7	-----	5	23	1	-----	2	³ 23	15
Poliomyelitis.....	1	1	-----	-----	-----	-----	-----	-----	1	1
Tetanus.....	-----	1	-----	-----	-----	-----	2	-----	2	1
Tuberculosis.....	-----	18	-----	9	1	1	-----	13	³ 1	41
Typhoid fever.....	1	-----	-----	-----	-----	-----	1	-----	2	-----
Whooping cough.....	-----	-----	-----	-----	1	-----	-----	-----	³ 1	-----

¹ If place of infection is known, cases are so listed instead of by residence.

² 3 recurrent cases.

³ Reported in the Canal Zone only.

DEATHS DURING WEEK ENDED NOVEMBER 27, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Nov. 27, 1948	Corresponding week, 1947
Data for 93 large cities of the United States:		
Total deaths.....	8, 535	8, 952
Median for 3 prior years.....	8, 952	-----
Total deaths, first 48 weeks of year.....	439, 108	439, 496
Deaths under 1 year of age.....	596	646
Median for 3 prior years.....	678	-----
Deaths under 1 year of age, first 48 weeks of year.....	31, 843	35, 171
Data from industrial insurance companies:		
Policies in force.....	70, 795, 605	67, 036, 867
Number of death claims.....	9, 921	10, 914
Death claims per 1,000 policies in force, annual rate.....	7. 3	8. 5
Death claims per 1,000 policies, first 48 weeks of year, annual rate.....	9. 2	9. 2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 13, 1948.—Cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunsw- wick	Que- bec	Ont- ario	Mani- toba	Sas- katch- ewan	Al- berta	British Colum- bia	Total
Chickenpox.....		33		259	461	91	97	113	173	1,227
Diphtheria.....				16	2	3				21
Dysentery, amebic.....								2		2
German measles.....				4	8		2	3	3	20
Influenza.....		32			2	4				38
Measles.....		30	4	141	125	36	60	48	79	523
Mumps.....		34		57	150	38	18	24	23	344
Poliomyelitis.....					8	4		9		23
Scarlet fever.....		5	3	173	84	10	5	11	10	301
Tuberculosis (all forms).....		7	5	89	25	16	17	8	38	205
Typhoid and paraty- phoid fever.....				4	1			1		6
Undulant fever.....				2	1					3
Veneral diseases:										
Gonorrhoea.....		13	5	123	73	21	17	37	68	357
Syphilis.....		4	15	86	31	3	4	4	13	160
Other forms.....									2	2
Whooping cough.....				93	9	4		3		109

FINLAND

Notifiable diseases—October 1948.—Cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	11	Paratyphoid fever.....	96
Diphtheria.....	242	Poliomyelitis.....	9
Dysentery, unspecified.....	1	Scarlet fever.....	250
Gonorrhoea.....	1,058	Syphilis.....	223
Malaria.....	5	Typhoid fever.....	18

POLIOMYELITIS

Ceylon.—During the period May 23–October 9, 1948, 133 cases of poliomyelitis with 7 deaths were reported in Ceylon.

Malay States (Federated).—From May 2 to October 23, 1948, 133 cases of poliomyelitis with 11 deaths were reported in the Federated Malay States. For the week ended October 30, 2 cases were reported, and no case was reported for the week ended November 6.

Netherlands Indies.—Since the beginning of the outbreak on September 4, 1948 (PUB. HEALTH REP. for November 19, 1948, p. 1532), 51 cases of poliomyelitis with 5 deaths had been reported in Netherlands Indies up to October 15.

Straits Settlements—Singapore.—During the period April 17–

October 30, 1948, 138 cases of poliomyelitis with 21 deaths were reported in Singapore. (See PUB. HEALTH REP. for October 15, 1948, p. 1378.) For the week ended November 6, only 1 case was reported.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

Note.—The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Cuddalore.—During the period September 26–October 9, 1948, 21 cases of cholera with 17 deaths were reported in Cuddalore, India.

Pakistan—Chittagong.—During the week ended November 6, 1948, 6 cases of cholera with 3 deaths were reported in Chittagong, Pakistan.

Plague

Java—Surabaya.—During the week ended November 13, 1948, 2 cases of plague were reported in the port of Surabaya, Java.

Peru—Lima Department—Chancay Province.—During the month of October 1948, 8 cases of plague with 4 deaths were reported in Chancay Province, Lima Department, Peru, distributed as follows: 5 cases, 3 deaths in Huaura Valley; 2 cases, 1 death in Pativilca Valley; 1 case in Sayan Valley.

Smallpox

Angola (Portuguese West Africa).—During the month of September 1948, 181 cases of smallpox, with 3 deaths, were reported in Angola.

Iran—Abadan.—For the week ended October 25, 1948, 17 cases of smallpox were reported in the port of Abadan, Iran.

Iraq.—During the week ended November 27, 1948, 119 cases of smallpox with 3 deaths were reported in Iraq, including 37 cases in the city of Baghdad. During the week ended November 20, 50 cases were reported in Baghdad.

Nigeria.—For the period September 1–30, 1948, 209 cases of smallpox with 32 deaths were reported in Nigeria, of which 21 cases, 10 deaths were stated to have occurred in the port city of Degema-Abonnema.

Syria.—For the period November 1–20, 1948, 171 cases of smallpox were reported in Syria.

Yellow Fever

Peru—Loreto Department.—On July 2, 1948, 1 death from yellow fever was reported in Nauta, Loreto Province, in Loreto Department, Peru.